Claims

[c1] 1. A tool holder assembly comprising:
a cutting tool including:
a main portion having a first diameter;
an end portion having a second diameter and disposed proximate the main portion; and
a fluid passage disposed in the main and end portions;
a tool holder including:
a conduit; and
a counterbore axially aligned with the conduit and adapted to receive the cutting tool; and
an adapter including:
a tool receiving portion configured to receive the end portion;
a body portion disposed proximate the tool receiving portion and adapted to engage the conduit; and
an internal fluid passage defined by the tool receiving and body portions that is adapted to provide a fluid from the conduit to the fluid passage.

[c2] 2. The tool holder assembly of claim 1 wherein the internal fluid passage further includes a chamfer disposed proximate the tool receiving portion and adapted to di-

rect a fluid to the fluid passage.

[c3] 3. The tool holder assembly of claim 1 wherein the adapter further comprises a first internal fluid passage disposed in the body portion and second and third internal fluid passages disposed in the tool receiving portion proximate the first internal fluid passage.

[c4] 4. The tool holder assembly of claim 1 wherein the counterbore further comprises a bottom surface disposed proximate the conduit.

[c5] 5. The tool holder assembly of claim 4 further comprising a spring disposed between the tool receiving portion and the bottom surface for biasing the adapter against the end portion.

[c6] 6. The tool holder assembly of claim 1 further comprising a seal disposed between the end portion and the tool receiving portion for inhibiting fluid leakage.

[c7] 7. A tool holder assembly comprising:
a cutting tool including:
a main portion having a first diameter;
an end portion having a second diameter; and
a fluid passage disposed in the main and end portions;
a tool holder configured to rotate about an axis of rotation including:

a conduit; and
a counterbore adapted to receive the cutting tool and having a bottom surface; and
an adapter including:
a tool receiving portion configured to receive the end portion;
a body portion disposed proximate the tool receiving portion and adapted to engage the conduit; and
an internal fluid passage defined by the tool receiving and body portions that is adapted to provide a fluid from the conduit to the fluid passage; and
a spring configured to bias the adapter against the cutting tool to inhibit fluid leakage.

[c8] 8. The tool holder assembly of claim 7 wherein the spring is configured to engage the bottom surface and the tool receiving portion.

[c9] 9. The tool holder assembly of claim 7 wherein the internal fluid passage further includes a chamfer disposed proximate the tool receiving portion and adapted to direct a fluid to the fluid passage.

[c10] 10. The tool holder assembly of claim 7 wherein the adapter further comprises a first internal fluid passage disposed in the body portion and second and third internal fluid passages disposed in the tool receiving portion

proximate the first internal fluid passage.

[c11] 11. The tool holder assembly of claim 7 further comprising a seal disposed between the end portion and the tool receiving portion for inhibiting fluid leakage.

[c12] 12. The tool holder assembly of claim 7 wherein the second diameter is configured to flex about the axis of rotation to facilitate insertion of the adapter into the conduit.

[c13] 13. The tool holder assembly of claim 7 wherein the first diameter is larger than the second diameter.

[c14] 14. The tool holder assembly of claim 7 wherein the end portion further includes a first fluid passage and the main portion further comprises a plurality of branch fluid passages disposed about the axis of rotation and a chamber disposed proximate the first fluid passage and the plurality of branch fluid passages.

[c15] 15. The tool holder assembly of claim 14 wherein the chamber has a tapered surface for directing fluid flow from the first fluid passage to the plurality of branch fluid passages.

[c16] 16. A tool holder assembly comprising:
a cutting tool including:

a main portion having a first diameter and a first fluid passage;

an adapter portion disposed proximate the main portion having a second diameter and a second fluid passage disposed coaxially with an axis of rotation and connected to the first fluid passage; and

a tool holder including:

a conduit adapted to receive at least a portion of the adapter portion and provide a fluid to the second fluid passage; and

a counterbore axially aligned with the conduit and adapted to receive the cutting tool.

[c17] 17. The tool holder assembly of claim 16 wherein the first diameter is greater than the second diameter.

[c18] 18. The tool holder assembly of claim 16 wherein the adapter portion is configured to flex about the axis of rotation to facilitate insertion of the adapter portion into the conduit.

[c19] 19. The tool holder assembly of claim 16 wherein the main portion further comprises a plurality of branch fluid passages disposed about the axis of rotation and a chamber disposed proximate the second fluid passage and the plurality of branch fluid passages.

[c20] 20. The tool holder assembly of claim 19 wherein the chamber has a tapered surface for directing fluid flow from the second fluid passage to the plurality of branch fluid passages.